2. The computer implemented method of claim 1, the lock-in thermal imaging technique comprising obtaining the plurality of infrared thermal images at a plurality of modulation frequencies.

3. The computer implemented method of claim 1, the step of developing, by the computing system, the plurality of input images comprising a two-channel image correlation process and/or comprises inverting an in-phase signal and a quadrature signal.

4. The computer implemented method of claim 1, the step of developing, by the computing system, the plurality of score images comprising principal component analysis of an input matrix, the input matrix comprising a collection of input image matrices.

5. The computer implemented method of claim 4, the collection of input image matrices comprising a collection of phase image matrices or a collection of amplitude image matrices.

6. The computer implemented method of claim 1, wherein the plurality of similarity measures is applied, by the computing system, to fewer than all of the plurality of score images.

7. The computer implemented method of claim 6, wherein the plurality of similarity measures is applied, by the computing system, to only a single score image.

8. The computer implemented method of claim 1, further comprising extracting, by the computing system, via orthogonal moments, a plurality of features from the one or more score images and from each of the plurality of reference images, the plurality of similarity measures being applied, by the computing system, to the extracted features.

9. The computer implemented method of claim 8, wherein the extracted features comprise Zernike moments or pseudo Zernike moments.

10. The computer implemented method of claim 9, wherein the Zernike moments comprise from about 10 to about 50 Zernike basis polynomials.

11. The computer implemented method of claim 1, the similarity measures comprising from about 5 to about 20 similarity measures.

12. The computer implemented method of claim 1, the similarity measures comprising one or more correlation coefficients, one or more Euclidean distances, one or more angles, a determinant, one or more unconstrained Procrustes analyses, one or more constrained Procrustes analyses, one or more Mahalanobis distances, or any combination thereof.

13. The computer implemented method of claim 1, further comprising fusing, by the computing system, the similarity values for each of the possible identities of the defaced mark.

14. The computer implemented method of claim 13, the step of fusing, by the computing system, the similarity values for each of the possible identities of the defaced mark comprising application of one or more data fusion rules to the similarity values.

15. The computer implemented method of claim 14, the data fusion rules comprising sum, geometric mean, harmonic mean, median, L2 norm, L1 norm, truncated geometric mean, truncated harmonic mean, or any combination thereof.

16. The computer implemented method of claim 15, the data fusion rules incorporating raw values, rank values, or combinations thereof.

17. The computer implemented method of claim 13, further comprising ranking, by the computing system, the fused similarity values for each of the possible identities of the defaced mark.

18. The computer implemented method of claim 17, the ranking comprising a majority vote ranking or a sum rule ranking.

19. The computer implemented method of claim 18, the ranking comprising both a majority vote ranking and a sum rule ranking.

20. A computer-implemented non-destructive method for identifying a defaced mark in a metal surface comprising:

obtaining at each of a plurality of modulation frequencies, a plurality of infrared thermal images of a defaced area on a metal surface according to a lock-in thermal imaging technique;

developing, by a computing system comprising one or more computing devices, a plurality of input images from the plurality of infrared thermal images, the input images comprising phase images, amplitude images or a combination thereof;

developing, by the computing system, a plurality of input matrices, each input matrix comprising a concatenated collection of a plurality of input images;

carrying out a principal component analysis of each input matrix;

developing, by the computing system, a plurality of score images from each input matrix, each score image being a reconstruction into an image of a single principal component obtained through the principal component analysis of each input matrix;

extracting, by the computing system, a plurality of features from each of the score images, the extracted features comprising Zernike moments or pseudo Zernike moments;

applying, by the computing system, a plurality of similarity measures to the extracted features of the plurality of score images and to similar extracted features from each of a plurality of reference images to obtain a plurality of similarity values for each of a plurality of possible identities of the defaced mark;

fusing, by application of one or more data fusion rules by the computing system, the similarity values for each of the possible identities of the defaced mark;

ranking, by the computing system, the fused similarity values according to a majority vote ranking rule and a sum ranking rule; and

assigning, by the computing system, an identity to the defaced mark based upon the ranking.

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